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IS 11844 (1987): Corrugated fibreboard boxes for transport packaging of apples [CHD 15: Paper and its products]



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IS : 11844 • 1987

Indian Standard

**SPECIFICATION FOR
CORRUGATED FIBREBOARD BOXES FOR
TRANSPORT PACKAGING OF APPLES**

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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Indian Standard

SPECIFICATION FOR CORRUGATED FIBREBOARD BOXES FOR TRANSPORT PACKAGING OF APPLES

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*Dr A. N. Nayer chaired the meeting in which this standard was finalized.

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Indian Standard
**SPECIFICATION FOR
CORRUGATED FIBREBOARD BOXES FOR
TRANSPORT PACKAGING OF APPLES**

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 January 1987, after the draft finalized by the Paper and Flexible Packaging Sectional Committee had been approved by the Marine, Cargo Movement and Packaging Division Council.

0.2 Wooden cases have been in use for the packing and transport of apples in the country. With our fast diminishing forest resources, it has become necessary to look for some alternate packaging material to conserve our forest wealth. Corrugated fibreboard boxes have been put into use for the packaging of apples and have proved a good substitute for corrugated fibreboard wooden cases. Moreover, standardization of one size of the box has further reduced the variety of sizes which were being used in wooden cases. While preparing the standard, emphasis has been laid on the performance requirements of the boxes rather than specifications of the raw materials, for example, kraft paper, adhesives, etc, which go into making of a box. Since it is difficult to comply with the requirements of the Indian Standard for the kraft paper by our paper industry, ultimate strength requirements of the fibreboard/box have been specified in this standard.

0.3 For the purpose of deciding wheather a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard lays down the requirements for corrugated fibreboard boxes for the transport packaging of 16 to 20 kg of apples.

*Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.1 For the purpose of this standard, the terms and definitions used in IS : 2771 (Part 1)-1977* and IS : 7186-1973† shall apply.

3. MATERIAL

3.1 The fibreboard shall be manufactured from kraft paper or kraft liner.

3.2 Adhesive — Any suitable adhesive capable of firmly adhering the various plies together may be used. Sodium silicate or any other highly alkaline adhesive shall not be used.

3.3 Staple Wire — Mild steel, galvanized 0.52 mm thick \times 2.65 mm wide shall be used for stapling the manufacturer's joint.

4. MANUFACTURE, WORKMANSHIP AND FINISH

4.1 Style — The boxes shall be made of corrugated fibreboard with narrow flutes and telescopic construction as shown in Fig. 1 (*see* style 0320 of IS : 6481-1971‡). The upper and lower pieces of the box shall be sliding freely on each other.

4.2 Each piece of the box (inner or outer) shall be manufactured from not more than two pieces of fibreboard, scored and slotted to form a body piece. The flaps along the longer edge shall form the outerflaps and those along the shorter edge shall form inner flaps. All flaps shall be of equal length and the outer flaps shall meet when closed (*see* Fig. 1).

4.3 The blanks shall be properly creased and slotted, so that when the box is assembled, there shall be no holes at the corners.

4.4 The body joint shall be lapped and lapping shall not be less than 30 mm. The lap joint shall be secured by staples which shall be free from rust and not protruding. Each piece shall not have more than two body joints. The spacing between two stitches shall be not more than 50 mm. The distance between the outer staples and the end joint shall not exceed 25 mm.

4.5 Dimensions and Tolerances — Inside dimensions of the inner piece shall be $504 \times 303 \times 290$ mm ($L \times B \times H$). The tolerance on

*Fibreboard boxes: Part 1 Corrugated fibreboard boxes (*first revision*).

†Glossary of terms relating to paper and flexible packaging.

‡Guide for principal uses and styles of fibreboard containers.

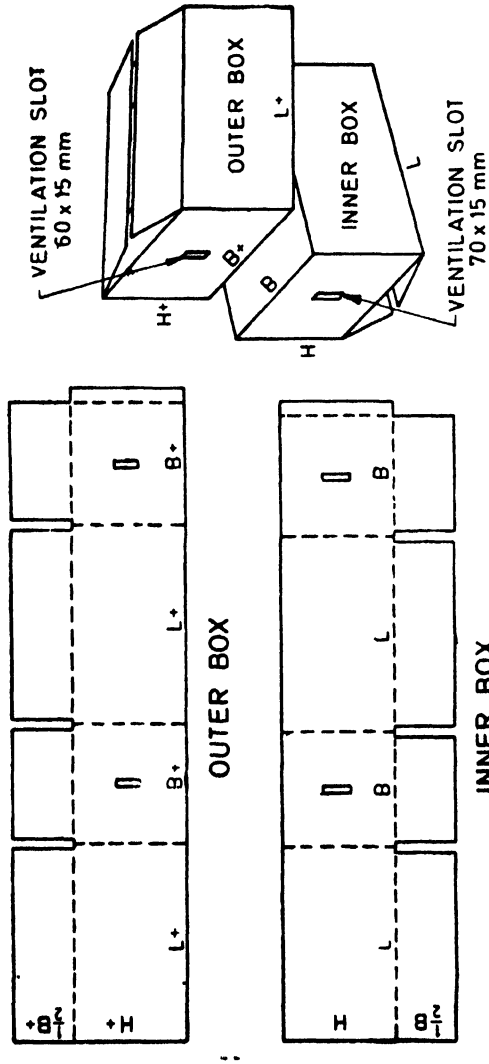


FIG. 1 TELESCOPIC TYPE CORRUGATED FIBREBOARD BOXES FOR TRANSPORT PACKAGING OF APPLES

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each individual dimension shall be ± 3 mm. One verticle slot on each shorter side of the box both on the inside and the outside piece shall be provided. The slots shall be so cut that they match each other on assembly so as to provide clear ventilation to the fruit. The length of the slots on the inner box shall be 10 mm more than the slot on the outer box as shown in Fig. 1.

5. CORRUGATED FIBREBOARD REQUIREMENTS AND TESTS

5.1 Bursting Strength — The bursting strength of the board when determined according to the method given in 12.5 of IS : 1060 (Part 1)-1966* shall be not less than 10 kgf/cm².

5.2 Puncture Resistance — When determined by the method given in 8 of IS : 4006 (Part 2)-1985† the puncture resistance shall be not less than 240 Beach units.

5.3 Water Absorption (30 Minutes Cobb Test) — The outer surface of the outer piece and the inner surface of the inner piece of the box when subjected to water absorption (30 minutes Cobb) test for 30 minutes as per method given in 6 of IS : 4006 (Part 1)-1966‡ shall not absorb more than 120 g/m² of water.

5.4 Compression Strength of the Box — The complete empty boxes conditioned at a temperature of $27 \pm 2^{\circ}\text{C}$ and 65 ± 2 percent relative humidity shall be tested in assembled condition for compression strength as per method given in IS : 7028 (Part 6)-1973§. The average compression strength of the empty box at a deflection not more than 20 mm shall not be less than 500 kgf.

5.5 Flap Bend Test — The flaps of the inner and outer pieces of the box shall be capable of being folded through 180° inside and then back through 180° outside along the line of creasing without showing any sign of fracture of the board on creasing.

6. PACKING AND MARKING

6.1 Boxes shall be supplied in collapsed condition in bundles of 20 or as agreed to between the purchaser and the supplier. Each box shall

*Method of sampling and test for paper and allied products, Part 1 (revised).

†Methods of test for paper and pulp based packaging materials, Part 2 (first revision).

‡Methods of test for paper and pulp based packaging materials, Part 1.

§Performance tests for complete, filled transport packages: Part 6 Compression test.

be legibly and indelibly marked on the outside with the following particulars:

- a) Batch or lot number;
- b) Manufacturer's name, initials or recognized trade-mark; and
- c) Any other information as required by the purchaser.

6.1.1 The boxes may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

7. SAMPLING, CONDITIONING AND TESTING

7.1 The boxes shall be sampled and tested within 20 days of their receipt by the purchaser. From each consignment of 10 000 boxes or part thereof 20 boxes shall be selected for testing as follows:

- a) If the boxes are bundled, 20 bundles shall be selected at random and from each bundle so selected one box shall be selected at random for testing.
- b) If the boxes are not bundled 20 boxes shall be selected at random from the total consignment.

7.2 Conditioning

7.2.1 The sample of 20 boxes so selected shall be deemed to represent the whole consignment of boxes and shall be conditioned for testing by the method prescribed in 5 of IS : 1060 (Part 1)-1966*.

7.3 Testing

7.3.1 The types of tests and selection of boxes for testing shall be as indicated in Table 1.

7.3.1.1 The requirements for the material of construction of box as well as method of test for evaluating these requirements shall be as given in relevant clauses and in Table 1.

*Methods of sampling and test for paper and allied products, Part 1 (*revised*).

TABLE 1 TESTING OF BOXES
(*Clauses 7.3.1 and 7.3.1.1, 7.4.1 and 7.4.2*)

Sl. No.	TYPE OF TEST	NO. OF BOXES SELECTED FROM SAMPLE FOR TESTING	NO. OF TEST SPECIMENS OBTAINED FROM EACH BOX	NO. OF TESTS ON EACH TEST SPECIMEN	METHODS OF TEST, REFERENCE TO CLAUSE
(1)	(2)	(3)	(4)	(5)	(6)
i)	Bursting strength (5.1)	3	1	10 (5 each side)	12.5 of IS : 1060 (Part 1)-1966*
ii)	Puncture resistance (5.2)	3	4 (2 each for cross direction and machine direction)	1	9 of IS : 4006 (Part 2)-1985†
iii)	Water absorption 30 minutes cobb test (5.3)	3	2 (One from outer box and one from inner box)	1 (on external surface of the outer piece of the box and on internal surface of the inner piece of the bar box)	6 of IS : 4006 (Part 1)-1966‡
iv)	Compression strength test (5.4)	5	1	1	IS : 7028 (Part 6)-1973§
v)	Flap bend test (5.5)	3	2	1	5.5

*Methods of sampling and test for paper and allied products, Part 1 (*revised*).

†Methods of test for paper and pulp based packaging materials, Part 2 (*revised*).

‡Methods of test for paper and pulp based packaging materials, Part 1.

§Performance tests for complete, filled transport packages: Part 6 Compression test.

7.4 Acceptance and Retesting

7.4.1 Acceptance — The consignment of boxes shall be deemed to comply with the test requirements of the standard if after the specified number of boxes from the test sample as given in Table 1 have been tested as required in relevant clauses and all the boxes pass the test.

7.4.2 Retests — If only one box from the test sample fails to meet one or more of the test requirements of the specification further boxes shall be selected at random from the consignment of boxes for testing for the defective property or properties. The number of additional boxes to be tested shall be twice the number specified in Table 1 for the test or tests in which the box from the original test sample failed.

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